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| EXAMINER | |
|---|---|
| LEBASSI, AMANUEL | |
| ART UNIT | PAPER NUMBER |
| 2617 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/579,775 | HULBERT ET AL. | |
| | Examiner | Art Unit | |
| | AMANUEL LEBASSI | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**2.** Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouffet et al. US 5,668,556 in view of Emmons, Jr. et al. US 6,570,858.

Regarding claim 1, Rouffet discloses a method of communication in a Time division duplex (TDD) satellite communication system **(see abstract)**. Rouffet discloses at least one satellite and a plurality of terrestrial terminals (**abstract, col. 1 lines 9-13, where Rouffet discusses TDD communications system between low-orbit satellites and terminals**). Rouffet discloses allocating time division multiple access (TDMA) time slots for transmission between the satellite and any one of the plurality of terminals (**col. 1, lines 43-49-, col. 4 lines 35-55, allocating time division multiple access TDMA-TDD**) Rouffet discloses such that for any given terminal, transmit time slots for transmission to the satellite and receive time slots for reception from the

satellite are separated in time (**Fig. 3 and col. 7, lines 10-30, where for a given transmission, the corresponding reception occurs one frame later therefore the receive and transmit time slots are separated in time**). Rouffet discloses wherein propagation delay is not an exact number of multiples of frame length (**col. 7, line 11-26 – where propagation delay is different because location of the mobile stations as some are farthest from the satellite**). Rouffet discloses wherein an assigned time delay between transmit and receive time slots at the any one terminal is small compared with round trip propagation delay (**col. 7, lines 27-30 where for a given transmission, the corresponding reception occurs one frame later, and the signal must travel via satellite, therefore time delay is small compared with round trip propagation delay**). Rouffet discloses when the transmit time slot for one terminal causes a transmission from that one terminal to be received at another terminal overlapped in time with a receive time slot allocated for the other terminal (**see col. 6 lines 65-67, col. 7 lines 1-20**). Rouffet disclose then those two terminals are placed in different regions of beams, such that an interference path between the two terminals is negligible (**see col. 6 lines 65-67, and col. 7 lines 1-35, where Rouffet discusses a spacial separationt to implement TDD**).

Rouffet discloses different regions, but does not specifically disclose spaced apart. However, Emmons, Jr., teaches Time division duplex (TDD) satellite communication system and spacing apart (**(see abstract, col. 5 lines 19-42, where Emmons Jr., discusses spatial separation to accommodate TDD links**). .

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the invention of Rouffet and using special separation, as taught by Emmons Jr., thereby adding to spectral efficiency, as discussed by Emmons Jr., **(col. Lines 48-53)**

Regarding claim 10, Rouffet discloses a method **(see abstract, and col. 1 lines 9-13, where Rouffet discusses a method in a Satellite system).** Rouffet discloses allocating, by a satellite, a plurality of time slots on a frequency for transmission to and reception from a plurality of terminals **(see col. 1 lines 9-13, and col. 5 lines 5-8).** Rouffet discloses the plurality of time slots provide Time division duplexing (TDD)/time division multiple access (TDMA) time slots on the frequency (**abstract, and col. 4 lines 34-57, where Rouffet discusses TDMA, TDD communications system between low-orbit satellites and terminals therefore satellite and multiple terminals**). Rouffet discloses transmitting, by the satellite to a first of the plurality of terminals, in one of the plurality of time slots (**col. 1, lines 9-13, col. 1 lines 43-49-, and col. 5 lines 5-10, allocating time division multiple access TDMA-TDD**). Rouffet discloses receiving, by the satellite from a second of the plurality of terminals, in another of the plurality of time slots **(see Fig. 3, col. 2 lines 40-47 and col. 7, lines 11-16, 27-30, where Rouffet discusses TDD communications in a GSM mobile phone, Satellite system, therefore mobiles communicating in different time slots )**. Rouffet discloses wherein when the first and second terminals are in different zones or regions a predetermined distance the first terminal transmits to the satellite over the frequency at a same time as the second terminal receives rom the satellite ove the frequency **(see**

**col. 6 lines 55-67, and col. 7 lines 1-22, where Rouffett discusses different zones to accommodate TDD communications TDMA, TDD being slots on same frequency but staggered for transmit and receive**

Rouffet discloses different zones, but does not specifically disclose the terminals are spaced apart. However, Emmons, Jr. teaches the terminals are spaced apart (**(see abstract, col. 5 lines 19-42, where Emmons Jr., discusses spatial separation to accommodate TDD links)**.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the invention of Rouffet and using special separation, as taught by Emmons Jr., thereby adding to spectral efficiency, as discussed by Emmons Jr., **(col. Lines 48-53)**

Regarding claim 2, Rouffet discloses signals between the terminals and the satellite are synchronized at the satellite (**col. 4, lines 63 col. 5, line** 4).

Regarding claim 3, Rouffet discloses alternate time slots at the satellite are used for transmission and reception (**see Fig. 3**).

Regarding claim 4, Rouffet discloses wherein the terminals use navigational information to estimate their propagation delay to the satellite; and thus to determine the time required to transmit into an allocated time slot (**col. 6, lines 13-18**).

Regarding claim 5, the combination of above discloses wherein the satellite transmits ephemeris data to the terminals to aid in determining the propagation delay (**see above**).

Regarding claim 6, Rouffet discloses wherein the position of each terminal is determined by the satellite, using location data provided by each terminal delay (**col. 2, lines 63 – col. 4, line 4**).

Regarding claim 7, Rouffet discloses wherein downlink timeslots are allocated to terminals at random (**See Fig. 4**).

Regarding claim 8, Rouffet discloses wherein uplink timeslots are allocated in order to avoid a transmission at one terminal being received by another terminal at a time for which the other terminal has been allocated a receive time slot (**See Fig. 3**).

Regarding claim 9, the combination of above discloses wherein terminal receive time slots are allocated randomly; wherein allocation of terminal transmit time slots includes the steps of: calculating the minimum distance between a transmitting terminal and a receiving terminal which receives the transmission; repeating this calculation for all terminal transmit time slots; repeating the calculation for all terminals; calculating the resulting interference if each terminal used its worst terminal time slot; ranking the

terminals according to which cause the worst interference with another terminal; and starting from the worst terminal, allocating the best time slot for that terminal, discarding terminal transmit time slots where transmit and receive time slots overlap in the same terminal (see above).

Regarding claim 11, Emmons, Jr. teaches receiving, by the satellite, location information from the first and second terminals, wherein the received location information is used for determining whether the first and second terminals are spaced apart the predetermined distance **(col. 8, lines 64—col. 9, line 7).**

Regarding claim 12, Emmons, Jr. teaches wherein the plurality of time slots are arranged into a plurality of frames, each of the plurality of frames having a duration less than a duration of a round trip propagation delay between at least one of the plurality of terminals and the satellite **(See Fig. 5).**

***Conclusion***

1. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Amanuel Lebassi, whose telephone number is (571) 270-5303. The Examiner can normally be reached on Monday-Thursday from 8:00am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Nick Corsaro can be reached at (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

*Amanuel Lebassi*

/A. L/

03252010

/NICK CORSARO/

Supervisory Patent Examiner, Art Unit 2617